

AMENDMENTS TO THE CLAIMS

1-131 (canceled)

132. (original): A method of manufacturing a probe array comprising the steps of:

- a) bonding together a first substrate having a property of transmitting light and a second substrate comprising a high-refractive-index layer having a refractive index higher than that of said first substrate, an intermediate layer layered on said high-refractive-index layer and a supporting layer layered on said intermediate layer, in a condition in which said first substrate is in contact with said high-refractive-index layer;
- b) removing said supporting layer included in said second substrate;
- c) patterning by said intermediate layer exposed as a result of said supporting layer being removed;
- d) etching said high-refractive-index layer using the patterned intermediate layer so as to form a plurality of cone-like or pyramid-like projecting portions on said first substrate; and
- e) removing the patterned intermediate layer so that the probe array having the plurality of cone-like or pyramid-like projecting portions made from said high-refractive-index layer on said first substrate be obtained.

133. (original): The method as claimed in claim 132, wherein said high-refractive-index layer is of Si and said intermediate layer is of SiO₂.

134. (original): The method as claimed in claim 132, wherein said high-refractive-index layer is of GaP and said intermediate layer is of SiO₂.

135. (original): The method as claimed in claim 132, wherein said high-refractive-index layer is of a single-crystal material, said intermediate layer is of SiO₂ and said supporting layer is of Si.

136. (original): The method as claimed in claim 132, wherein said high-refractive-index layer is of a single-crystal Si, said intermediate layer is of SiO₂ and said supporting layer is of Si.

137. (original): The method as claimed in claim 132, wherein, in the etching, each of the plurality of projecting portions is formed so as to have a plurality of tapering angles on an outer wall thereof.

138. (original): The method as claimed in claim 132, wherein, in the etching, a bank portion having the same height as that of said plurality of projecting portions and arranged to surround said plurality of projecting portions is further formed.

139. (original): The method as claimed in claim 132, wherein etching is performed on the same high-refractive-index layer and a bank portion having the same height as that of said plurality of projecting portions and arranged to surround said plurality of projecting portions is further formed.

140. (original): The method as claimed in claim 132, wherein:

said probe array is such that a rotating recording medium, on which information is recorded, is arranged at tips of said plurality of projecting portions; and

in the etching, a bank portion arranged to surround said plurality of projecting portions and having an opening provided in a direction in which air flows due to rotation of the rotating recording medium, is further formed.

141. (original): The method as claimed in claim 140, wherein said bank portion has a tapered portion, inclined from a rotating-recording-medium-coming-in side of said first substrate to a rotating-recording-medium-going-out side of said first substrate, at an end thereof in a rotating-recording-medium-going-out direction.

142. (original): The method as claimed in claim 140, wherein said bank portion has a tapered portion, inclined from a rotating-recording-medium-coming-in side of said first

substrate to a rotating-recording-medium-going-out side of said first substrate, at a bank thereof in a rotating-recording-medium-coming-in direction.

143. (Currently amended): The method as claimed in claim 140, wherein said bank portion has a tapered portion, inclined in a radial direction of the rotating recording medium, at a bank ~~bank(s)~~ approximately parallel to a rotating-recording-medium-coming-in direction.

144. (original): The method as claimed in claim 140, wherein a length of said first substrate in a rotating-recording-medium-moving direction is determined based on a thickness thereof, a refractive index thereof and a numerical aperture of an optical component from which light is incident.

145. (original): The method as claimed in claim 132, wherein:

said probe array is such that a rotating recording medium on which information is recorded is arranged at tips of said plurality of projecting portions; and

etching is performed on the same high-refractive-index layer, and, said plurality of projecting portions, a bank portion arranged to surround said plurality of projecting portions and a pad portion coming into contact with the rotating recording medium are formed on a side of said first substrate facing the rotating recording medium.

146. (original): The method as claimed in claim 145,

wherein said pad portion is formed at a central position between a rotating-recording-medium-coming-in end and a rotating-recording-medium-going-out end of said first substrate, or at a position in a range between ± 0.1 from said central position assuming that an entire length of said first substrate is 1.

147. (original): The method as claimed in claim 132, wherein, after said intermediate layer is removed, a light-blocking film is formed on each of said plurality of projecting portions and a side of said substrate on which said plurality of projecting portions are formed, or only on each of said plurality of projecting portions.

148. (original): The method as claimed in claim 132, wherein, after said intermediate layer is removed, a light-blocking film is formed on an inclined surface of each of said plurality of projecting portions and a side of said substrate on which said plurality of projecting portions are formed, or only on the inclined surface of each of said plurality of projecting portions.

149. (original): The method as claimed in claim 132, wherein, when patterning is performed by said intermediate layer, said intermediate layer is to have a predetermined thickness at positions of respective tips of said plurality of projecting portions to be made and said intermediate layer at positions other than those of the respective tips of said plurality of projecting portions is to have a thickness equal to or smaller than said predetermined thickness.

150 – 209 (canceled)